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November 23, 1994

Judith Richards Hope, Esq.
Fellow of the Corporation, and
Chair of the Advisory Committee on Honorary Degrees
17 Quincy St.
Cambridge, MA 02138

RE: Honorary degree for Sir Edward Abraham, FRS

Dear Ms. Hope:

As a graduate of Harvard College (1952) and Harvard Medical School (1956), and a former faculty (Medicine) member (1965-1974), I write to nominate Sir Edward Abraham, FRS, of the University of Oxford, England, for an honorary degree at Harvard.

Sir Edward, now Professor of Chemical Pathology, Emeritus, at Oxford, received his undergraduate degree (The Queens College) and D.Phil., both at Oxford, and spent virtually his entire career at Oxford's Sir William Dunn School of Pathology. He is deserving of an honorary degree at Harvard in recognition of his discoveries and contributions concerning antibiotics, both at a basic level and in demonstrating their utility in helping mankind. There are few, if any, other living humans who have done as much to relieve suffering and prevent death of their fellow humans as has Sir Edward! Relatively few of us have never received an antibiotic, and most of us have received one or more penicillins and/or cephalosporins all of which are direct or indirect developments of his scholarly and scientific work.

Sir Edward was on the original "Oxford team" that first isolated penicillin and demonstrated that it was safe and capable of curing important and often fatal infections. His name is first on the 1940 *Lancet* publication that first reported the curative action of penicillin, thus, opening the antibiotic era and stimulating the search by thousands for the tens of thousands of compounds with antimicrobial activity that has ensued. The Nobel Prize "for penicillin" went to Florey, Fleming, and Chain.

With E.B. Chain, Abraham discovered "penicillinase", "a" bacterial enzyme that inactivated penicillin and accounted for its failure to kill certain bacteria. Subsequently, dozens of other "penicillinases" (now called β -lactamases) have been discovered (several by Sir Edward) and study of their biology and inhibition remains a dynamic field of research in attempts to better understand bacterial resistance and to devise novel therapies.

With one of his assistants, Guy Newton, Sir Edward discovered cephalosporin C, and showed that this substance, although related to penicillin was significantly different in its resistance to β -lactamases. They also demonstrated how derivatives and modifications of cephalosporin C could be made, producing varied and enhanced antibacterial activity. Tens of thousands of such derivatives have been made, and for

several decades cephalosporins accounted for about one-third of all American hospital pharmacy dollars spent on antibacterial drugs. The cephalosporins remain one of the largest and most useful groups of antibacterial drugs in use today!

He was one of the major chemists determining the structure of both penicillin and cephalosporin C. I believe he personally enlisted the aid of the late Dame Dorothy Hodgkin in determining the precise structures of both compounds by x-ray crystallography, giving her the crystals needed (this work was cited in her Nobel Prize Award). With others, he was also the first to show how β -lactamase inhibition by analogs could lead to increased antibacterial activity, and to show that zinc could serve as an essential cofactor for at least one β -lactamase. Both of these concepts have led to intensive on-going work.

This work on cephalosporins understandably resulted in considerable sums of money in royalties to Britain's National Research Development Corporation which holds those patents and supported his work. Because of its charter awarding those who made significant contributions that led to revenue, Sir Edward was personally entitled to impressive sums, the vast majority of which he channeled to form several trusts to support research at Oxford and externally through the Royal Society, in the fields of Biology, Chemistry, and Medicine. The buildings, renovations, professorships, fellowships, colleges, and scholarly activity at Oxford, supported by these funds, in themselves are extraordinary demonstrations of well-guided philanthropy that in themselves deserve recognition.

Sir Edward epitomizes what Harvard is all about: a bright young man entered college at one of the great, old, honored universities of this planet. He stayed on, continuing his work, interacting with extraordinary productivity and creativity with others there, achieving several remarkable successes that have virtually changed the world and touched the lives of a major segment of the world's population. Not all such successful university-based work brings the financial rewards that his has, but his unusual generosity reflects his regard for his university, his field, "his" Royal Society for continued scholarship and continued scientific advances. An honorary degree at Harvard would be an appropriate vehicle to feature the life, work, accomplishments and generosity of this creative and remarkable human being. A citation could correctly describe him as an "antibiotic wizard, loyal Oxonian, and generous patron of the sciences."

Sincerely,

A handwritten signature in black ink, appearing to read 'L.D. Sabath', with a stylized, flowing script.

L.D. Sabath, M.D.
Professor of Medicine
Division of Infectious Diseases

LDS/jaa
Enclosure